PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

WARFIELD T. LONGCOPE, M.D.,
DIRECTOR OF THE AYER CLINICAL LABORATORY, PENNSYLVANIA HOSPITAL.

ASSISTED BY

G. CANBY ROBINSON, M.D.
RESIDENT PATHOLOGIST, PENNSYLVANIA HOSPITAL, PHILADELPHIA.

Pathological Histology of Congenital Syphilis in Relation to the Spirocheta Pallida.—LEVADITI (*Ann. de l'Inst. Pasteur*, 1906, t. xx, p. 41) has been able to demonstrate Spirocheta pallida, often in great numbers, in the organs of six fœtuses from syphilitic mothers. By staining in bulk with silver nitrate small bits of the tissues hardened in formalin the organism may be seen in sections, and their distribution studied. They were found in decreasing numbers in the liver, lung, suprarenal glands, and skin, but always predominated in any organ which showed pathological change. In the lungs of a child who died of pneumonia alba they were very numerous. The parasites seemed to have a marked preference for the epithelial cells in which they seemed to lie. Besides, they invaded the vessel walls. They also seemed to undergo phagocytosis, for frequently the parasites were found in the large macrophages. The author belives that for this reason they are not common in the spleen. The maceration of the fœtus *in utero* is thought to depend upon some autolytic action which is set up after death from an intense infection by Spirocheta pallida.

Immunization against Swine Plague by the Help of Bacterial Extracts (Aggressins).—BAIL and others have shown that exudates produced in the body by the injections of certain bacteria have the property of enhancing the virulence of these same bacteria when injected with them into other animals, though if injected alone they are harmless. Wasserman and Citron have been able to obtain identical substances, so-called aggressins, from aqueous extracts of bacteria. Citron (*Zeit. f. Hyg. und Infekt.*, 1906, Band lii, p. 238) by injecting guinea-pigs and rabbits with 2 to 4 c.c. of these aggressin substances poured from exudates produced by the bacillus of swine plague or from serous or aqueous extracts of the bacillus itself has been able to immunize the animals against many times the fatal dose of a culture of swine plague. He finds, moreover, that the serum of immunized rabbits has a very definite quantitative protective power for guinea-pigs and mice against injections of fatal doses of swine plague.

Toxin of Fatigue.—WOLF-EISNER (*Centr. f. Bakt.*, 1906, Bd. xl, p. 634). Weichardt in 1904 advanced the theory that manifestations of fatigue were produced by a toxin generated in the overexerted organism which is similar to diphtheria, ricin, abrin, and tetanus toxins. For this fatigue toxin an antitoxin could be produced which *in vitro* and *in vivo* would neutralize it.

Wolf-Eisner in discussing this question puts forth the idea that athletic training may produce an immunity to this toxin, and thus allow the trained athlete to perform much more work than the untrained.

A fatigue toxin was obtained from animals fatigued by mechanical and experimental means which when inoculated into other animals in small doses produced symptoms of fatigue: drowsiness and a lessening of activity. The toxin is easily absorbed from mucous surfaces, and so it was administered in the experiments by spreading it on the conjunctiva. Death often follows the administration. A genuine antitoxic immunity was produced by the non-fatal doses.

The fatigue toxin was not found in the blood of animals, but in the muscles, while the blood contained the antitoxin. The toxin is not dialysable, while the antitoxin can be dialysed with ease. This difference the author thinks accounts for the fact that the antitoxin is found in the blood while the toxin is not.

The fatigue toxins have the properties of colloidal, high-molecular, albuminous bodies. The author thinks, however, that this may be due to the fact that the toxins cannot be separated from the albuminous bodies and so appear to be very similar to them.

It has been found that the use of the antitoxin of one animal is harmless to an animal of another species. The author believes that certain conditions, such as are found in neurasthenia, may be due to the lack of antitoxin production. By the breaking down of albumins by electrolysis, toxins can be formed which can also produce an antitoxin. The fatigue toxin is probably of this nature.

The Toxicological Constitution of Amanita Phalloides.—W. W. Ford (*Jour. of Exp. Med.*, 1906, vol. viii, p. 437) has shown in earlier papers that extracts of the poisonous mushroom Amanita phalloides contains a hemolytic principle, phallin, previously described by Kobert in 1891, which acts directly upon red blood corpuscles without the intermediation of serum, and is destroyed only at a temperature of 65° or higher. The hemolytic principle according to the author should be placed provisionally with the bacterial hemolysins. The extracts themselves are deadly poison to animals which, however, may be immunized against fatal doses. The immune serum is antihemolytic in a high degree.

This paper deals with the separation of a second substance from the hemolytic factor. Certain of the effects produced upon animals, such as hemoglobinuria and pigmentation of the spleen, could be accounted for by the action of phallin, but it was discovered that if the phallin was removed by treating the extract with red blood corpuscles the extract was still highly toxic. Heating to 65° destroys the hemolytic action without injury to the toxic factor. Extracts treated with emulsions of brain tissue remain unaffected. Finally, animals immunized with a hemolytic-free extract produce a serum which is not antihemolytic but antitoxic.

The author concludes that the extracts of the poisonous mushroom contain at least two substances: phallin, a thermolabile substance, which is the hemolytic principle, and in animals produces the subcutaneous œdema, hemoglobinuria, and pigmentation of the spleen; and a second body, termed by him amanito-toxin, which is thermostable, and in animals gives rise to hemorrhage, necrosis, and fatty degeneration of the organs.